

The Identities of *Pinnotheres nudus* Holmes, 1895 and *P. nudus* sensu Weymouth, 1910 (Crustacea: Decapoda: Pinnotheridae)

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Abstract.—The eastern Pacific species *Pinnotheres nudus* Holmes, 1895 is synonymized with *Opisthopus transversus* Rathbun, 1893. *Pinnotheres nudus* sensu Weymouth, 1910, named *P. holmesi* by Rathbun in 1918, also from the eastern Pacific, is shown to be a synonym of the western Atlantic *Zaops geddesi* (Miers, 1880), the second species to be assigned to the genus *Zaops* Rathbun, 1900.

Our ongoing studies of pinnotherid crabs of the Americas continue to yield new information on the identity of American species, newly discovered synonyms for them, and newly recognized genera and species from the Americas, including, *Tumidotheres* Campos, 1989; *Juxtafabia* Campos, 1993; *Epulotheres* Manning 1993; and *Nannotheres* Manning & Felder, 1997.

Here we clarify the identity of two species from California originally placed in the genus *Pinnotheres* Bosc, 1802: *P. nudus* Holmes, 1895, which we show to be a synonym of *Opisthopus transversus* Rathbun, 1893; and *P. nudus* sensu Weymouth, 1910, named *P. holmesi* by Rathbun (1918), which we believe is a synonym of *Zaops geddesi* (Miers, 1880), a western Atlantic species. This latter species probably was introduced in California, where it apparently has not become established.

Rathbun's (1893; 1918) accounts of the two species discussed here are so accurate that we quote them directly. We have added a few additional characters, indicated in italics, to her description of *Z. geddesi*.

Abbreviations used in the text include: cb, carapace width; cl, carapace length;

MXP3, third maxilliped; WL, walking leg(s). The acronym USNM indicates material in collections of the National Museum of Natural History, Smithsonian Institution, Washington, D.C., and UABC in collection of the Laboratorio de Invertebrados, Facultad de Ciencias, Universidad Autónoma de Baja California, México.

Opisthopus transversus Rathbun, 1893
Figs. 1, 2

Opisthopus transversus Rathbun, 1893:252 [type locality: Monterey, California (36°35'N, 121°55'W)]; 1918:172, fig. 110, pl. 37, figs. 4, 5.—Schmitt et al., 1973:131 [complete synonymy].

Pinnotheres nudus Holmes, 1895:563, pl. 20, figs. 1–5 [type locality: Santa Cruz, California].—Rathbun, 1918: 83, pl. 64.—Schmitt et al., 1973:60 [see for a complete synonymy based on the unique original record]. [Not *P. nudus* sensu Weymouth, 1910:53 = *Zaops geddesi* (Miers, 1880).]

Material examined.—2 males, Punta San Miguel, Todos Santos Bay, 13 Oct 1985, in *Aplysia vaccaria* Winkler, Ensenada, Baja California; 3 females (1 juvenile), Punta Sofia, 26–27 Dec 1989, in *Pseudochama*

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exogyra (Conrad); 1 male, in *Modiolus capax* (Conrad); 2 males, 2 females, 28–29 Dec 1990, in *P. exogyra*. 1 juvenil female, El Rincón, in cultured *Crassostrea gigas* (Thunbergs), 2 males, 3 females, La Bajada, 30–31 Dec 1990, in *Atrina tuberculosa* (Sowerby), Tortugas Bay, Baja California Sur (27°39'N, 114°54'W).

Description (from Rathbun 1918:83, as *P. nudus*).—Carapace a little broader than long, subquadrate with corners rounded, the anterior half nearly same shape and size as posterior half; surface curving downward toward all margins, smooth and naked; regions not defined. Front not protruding. Orbits ovate.

Chelipeds smooth, hands rather thick, widest immediately behind articulation of dactyl; fingers nearly or quite as long as palm, subconical, not conspicuously dentate on inner margin, partly covered by a very short, dense pubescence.

Three anterior legs subequal, fourth smaller; all are smooth, little compressed, and have acute, nearly straight tarsi, those of four pair being relatively longer and more slender than those preceding.

Abdomen of the female nearly circular, covering entire sternal surface, composed of seven separate segments of which the fourth, fifth, and sixth are subequal and larger than the others.

Remarks.—*Pinnotheres nudus* was described and named by Holmes (1895) on the basis of two females (cl 20 mm, cb 24 mm and cl 15.5 mm, cb 19 mm) from Santa Cruz, California. The female holotype and other female collected in Santa Cruz and Monterey, California, respectively, deposited in the California Academy of Sciences, were destroyed in the fire following the San Francisco earthquake in 1906 (Rathbun 1918).

Analysis of the Holmes's (1895) original description of *P. nudus* resulted in our finding that its morphology agrees very well with that observed in actual specimens of *O. transversus* Rathbun, 1893 (Fig. 2A–J). Both have the carapace dorsally smooth and

naked, subquadrate in outline, with rounded corners. They have a MXP3 with a carpus shorter than the spatulate propodus, and a spoon-shaped dactylus that is inserted proximally on the ventral margin of the propodus, with its apex extending beyond the tip of the propodus. Both have the WL1–3 subequal in length and shape, WL4 being shortest; an abdomen, nearly circular, composed of six somites and telson free, with somites 4–6 subequal and larger than the others. Other shared features include the large antennae, visible when dorsally, cheliped shape, and pubescence on the cheliped, MXP3, and abdomen. The lack of a suture between the ischium and merus of MXP3 in the original figure of *P. nudus* (Fig. 1E) is interpreted as an inaccuracy in the original artistic work. Further, that character was not mentioned in the original description. Females of *O. transversus* have a visible suture, although, as in some males, it sometimes is faintly indicated and can be overlooked. Crosnier (1969) reported a male lacking this suture. The carapace of *Opisthopus transversus* is variable in shape, in some specimens more quadrate, in others more rounded (Fig. 2A–C).

Based on the close similarity between actual specimens of *O. transversus* and the description and figures of *P. nudus* we believe that these two taxa should be considered synonyms.

Opisthopus transversus now ranges from Santa Cruz, California, U.S.A. to Laguna de San Ignacio, Baja California Sur, México. It is a symbiont in a wide variety of hosts including amphineuran mollusks, gastropods, bivalves, polychaetes and holothuroids (see Campos et al. 1992).

Zaops geddesi (Miers, 1880), new combination
Figs. 3, 4C–E

Pinnotheres geddesi Miers, 1880:86 [type locality: Veracruz, Mexico (19°11'N, 96°10'W); syntypes in The Natural History Museum, London].—Rathbun,

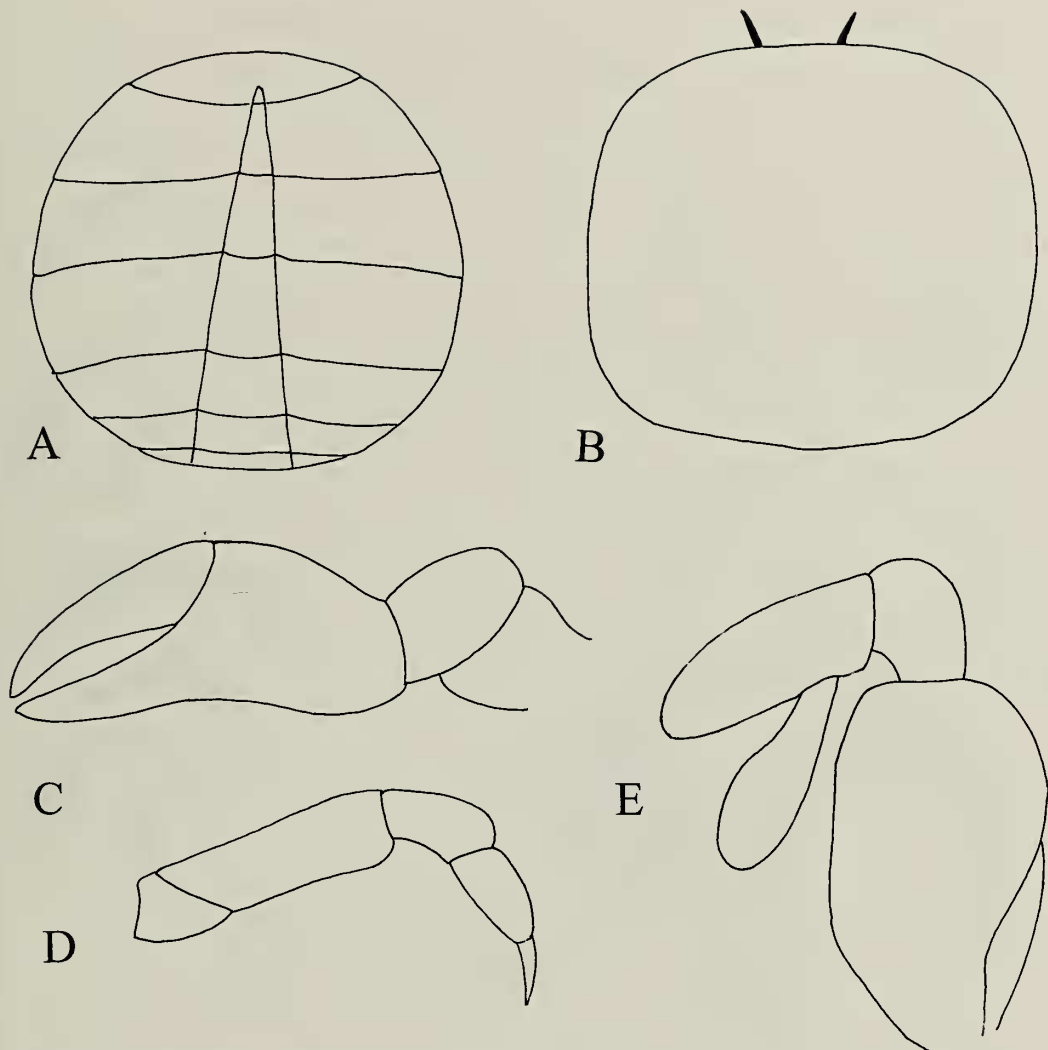


Fig. 1. *Pinnotheres nudus* Holmes, 1895, female holotype. A, Abdomen; B, Carapace; C, Left cheliped, outer aspect; D, Fourth WL; E, MXP3. (from Holmes 1895:pl. 20).

1918:70, fig. 32, pl. 16, figs. 1–4.—Schmitt et al., 1973:45 [complete synonymy].

Pinnotheres ostrearius Rathbun, 1901:20, fig. 3 [type-locality: Mayaguez, Puerto Rico (18°13'N, 67°09'W)]

Pinnotheres nudus.—Weymouth, 1910:53, fig. 1 [Monterey Bay, California (Monterey = 36°35'N, 121°55'W)] [not *P. nudus* Holmes, 1895 = *Opisthopus transversus* Rathbun, 1893].

Pinnotheres holmesii Rathbun, 1918:68, fig.

31, pl. 15, figs. 1, 2 [type locality: ?Pacific Grove, California (36°36'N, 121°56'W)].

Material examined.—*Pinnotheres ostrearius* Rathbun, holotype and paratype, USNM 23767; *P. holmesii* Rathbun, holotype, USNM 51000.

Description (except underlined, from Rathbun, 1918: 70, as *P. geddesii*).—“Carapace very soft and yielding, transversely suborbicular, broad behind. Gastric region

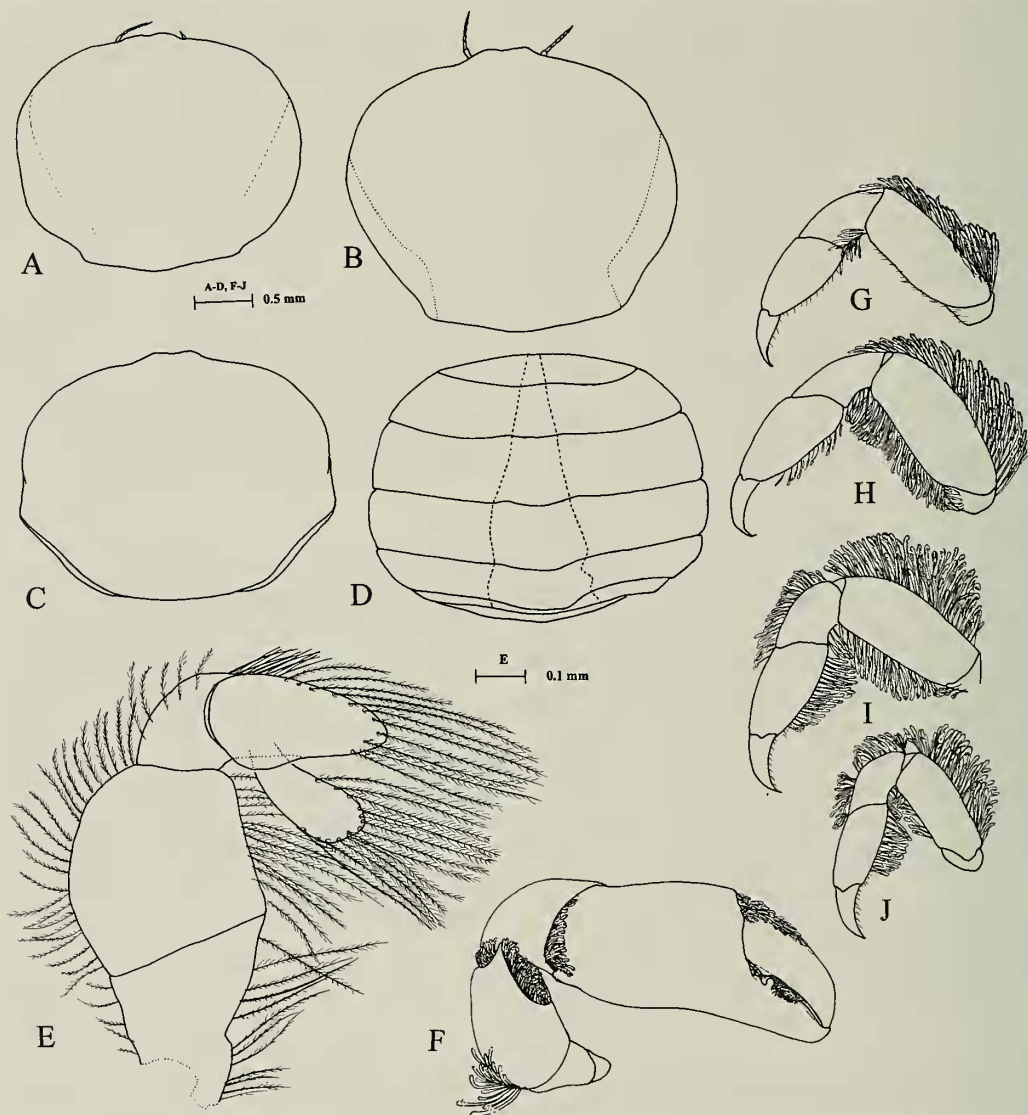


Fig. 2. *Opisthopus transversus* Rathbun, 1893, female UABC uncat. A–C, Carapace; D, Abdomen; E, MXP3; F, Right cheliped, outer aspect; G–J, WL1 to 4 respectively. A, Punta Sofia, Tortugas Bay, Baja California Sur, B, D–J, Punta San Miguel, Todos Santos Bay, Ensenada, Baja California UABC uncat; C from Crosnier, 1969, USNM 50997.

distinctly outlined by a furrow, cardiac region less distinct. Front rounding downward, slightly projecting, truncate in dorsal view. Orbits circular, eyes partly visible in dorsal view.

Ischium-merus of outer maxillipeds robust, outer margin regularly convex, inner margin with bluntly rounded angle near dis-

tal extremity; carpus and propodus robust, the latter rounded and ciliated at distal end; dactyl very slender, styliform, reaching about to extremity of propodus.

Chelipeds smooth; palm rapidly increasing in width from proximal to near distal end, which articulates almost vertically with dactylus; upper margin convex at widest

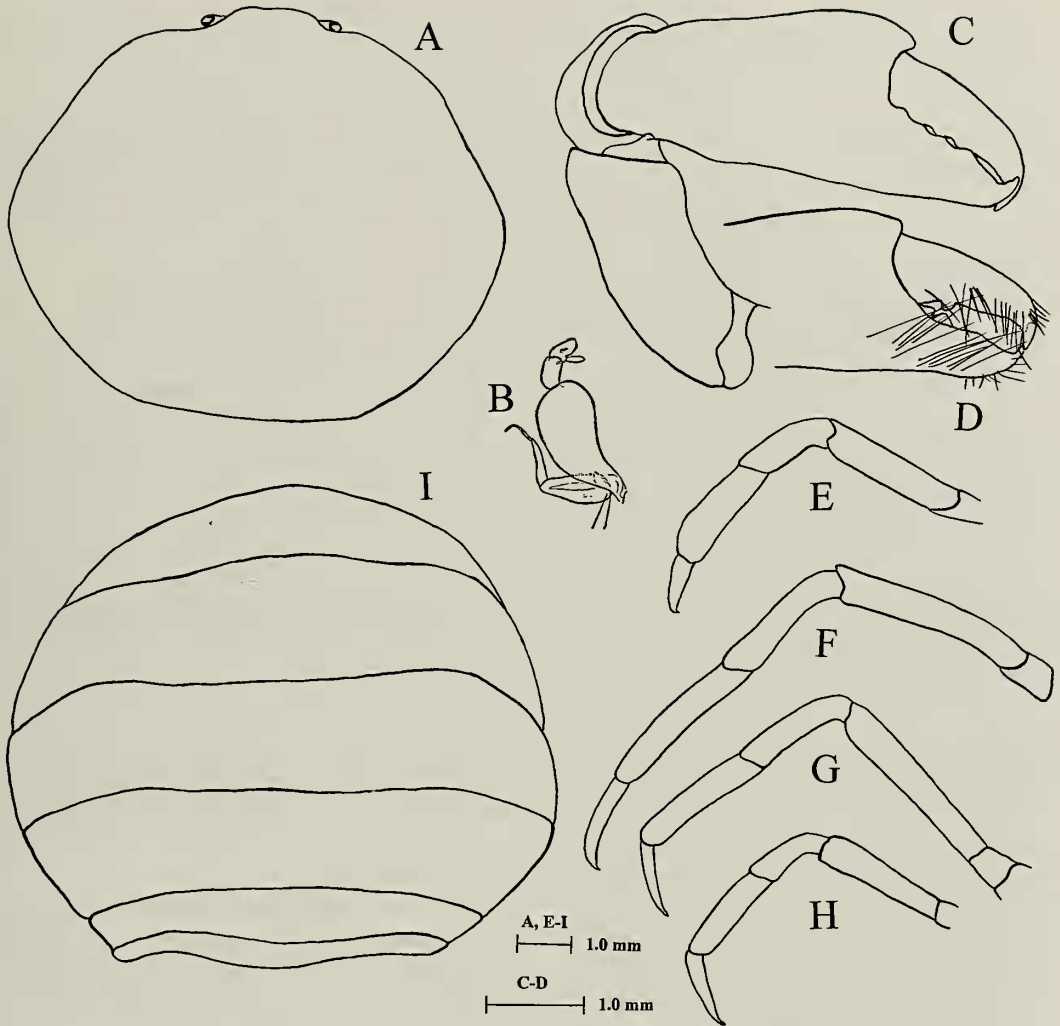


Fig. 3. *Pinnotheres holmesii* Rathbun, 1918, ovigerous female holotype, cl 7.2 mm, cb 8.7 mm, USNM 51000. A, Carapace, dorsal view; B, MXP3 (from Rathbun 1918:fig. 31); C, Left cheliped, outer aspect; D, Left chela, outer aspect; E-H, WL1-4, respectively.

part, lower margin of entire propodus convex; fingers subconical, somewhat hairy, edges meeting and tips crossed when closed.

Legs slender; first one stouter than the others, propodus scarcely widening distally, dactylus about half as long, stout, anterior margin convex, posterior straight; second leg longest, left (106 mm) slightly longer than right (100 mm) in holotype, third subequal to first; fourth reaches about to middle of propodus of third; dactylus of second

leg long, curved, about two-thirds as long as propodus; dactylus of third leg shorter, of fourth still shorter, straighter, and more hairy; third dactylus nearly straight behind, fourth quite straight behind”.

Remarks.—Our initial conclusion from an examination of Rathbun’s (1918) type of *P. holmesii* was that it is conspecific with *Zaops ostreum* (Say, 1818), the common western Atlantic oyster crab. Further study, however, convinced us that *P. holmesii* is identical to *P. geddesi* Miers, 1880, and that

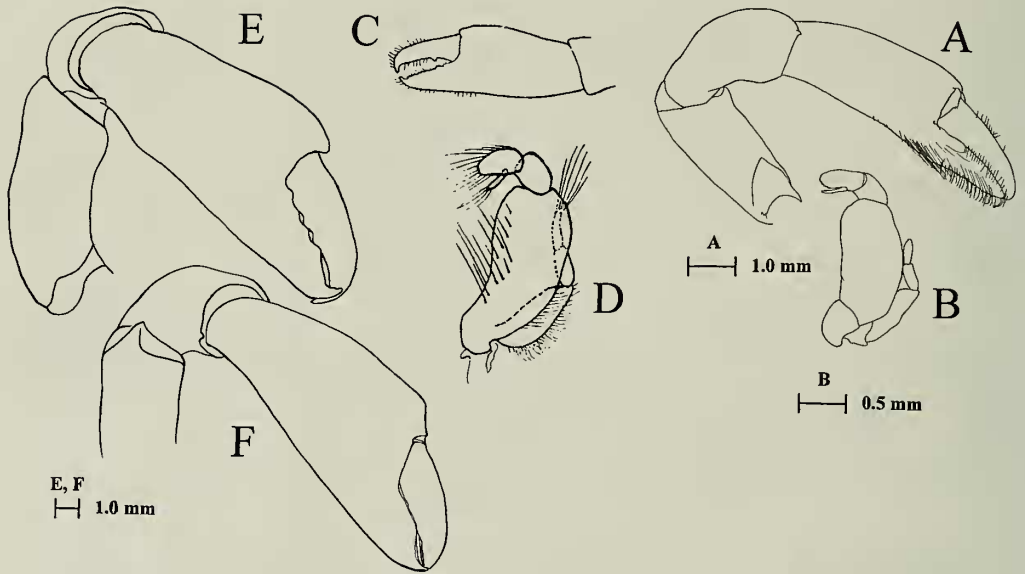


Fig. 4. Species of *Zaops*. A, B, F, *Z. ostreum* (Say, 1818), C–E, *Z. geddesi* (Miers, 1880), new combination (C, D, type of *P. ostrearius* Rathbun, 1901). A, Left cheliped, dorso-inner aspect; B, MXP3; C, Left chela, outer aspect; D, MXP3; E, F, Right chela, outer aspect. (A, B from Manning 1993:fig. 5; C, D, from Rathbun 1901:fig. 3 and Rathbun 1918:fig. 32).

Miers taxon should be transferred to the genus *Zaops*. It is the second species of *Zaops* Rathbun, 1900.

Rathbun [1918:63, (key); 69, (text)] commented that one of the distinguishing features of *Pinnotheres holmesi* is that the palm widens rapidly to a point behind base of fingers (Figs. 3C, 4A); she reported the same character in her account of *P. ostrearius* (1901:20). So far as we can tell, the shape of the palm is almost the same in *Z. geddesi* (Fig. 4E) and *Z. ostreum* (Fig. 4F). The species cannot be differentiated using this character.

The major difference in the chela of the two species lies in the angle of the articulation of the dactylus to the propodus. In *Z. geddesi* the articular surface of the propodus (Fig. 4E) is almost vertical, whereas in *Z. ostreum* that surface is at an oblique angle (Fig. 4F).

Another character mentioned by Rathbun (1918:69) is that the first three legs (WL1–3) are much slenderer in *Z. geddesi* than in *Z. ostreum*. This may not be true, as the length of the propodus is almost seven

times longer than high in *Z. ostreum*, less than six times longer than high in *Z. geddesi*. This may be a feature that varies with size and whether the longer or the shorter WL2 is measured.

A second, possible record for *Pinnotheres holmesi* is mentioned in a letter dated September 5, 1946 from H. W. Clark of Pacific Union College to S. A. Glassell. Clark noted:

“We found a specimen of *Pinnotheres holmesi*, as it appears to be, in the mantle cavity of a large clam. All we can find on it is in Schmitt’s Marine Decapods of California. . . Our specimen varies from his description in several points, not enough to make a new species, but perhaps enough to make a new subspecies. We found it on the Sonoma coast.”

So far as we can tell, this observation has never been published and we have not been able to determine whether the material is extant.

Zaops geddesi is the southern counterpart of *Z. ostreum*, and like *Z. ostreum*, its preferred habitat is in oysters, although no specific host has been mentioned in the literature. *Zaops geddesi* is known from Vera-

cruz, Mexico; Cuba; Puerto Rico; and Brazil (Rathbun 1918).

The single specimen of *Zaops geddesi* known to occur in the eastern Pacific must have been introduced around or before the turn of the century. There is no evidence that the species occurs naturally in the eastern Pacific.

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